

ART. V.—*On a New Species of Ceratodus from the  
Cretaceous of New South Wales.*

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(With Plate V.).

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**Introductory.**

The specimen now described is an opalised tooth of *Ceratodus*, from the Upper Cretaceous of Walgett, N.S.W. It was presented to the National Museum by T. C. Wollaston, Esq., of Glenelg, S.A. The external surface of the tooth has been remarkably well preserved during the opalisation process, even to the minutest pittings and rugosities. During replacement, the precious opal has infilled the hollow portions of the tooth with amorphous mineral, but the external part is faithfully replaced, as it still shows, in some places to the depth of 8 mm., the vasodentinal structure as clearly as in a recent tooth of *Ceratodus*. The tooth is somewhat imperfect, having lost approximately 6 mm. of the anterior denticle, and a small flake from the posterior denticle.

Description of *Ceratodus* (*Metaceratodus*)<sup>1</sup> *wollastoni*, subgen.  
and sp. nov.

This tooth, including a portion of the splenial bone, comes from the right side of the mandible, or lower jaw. It carries four denticles which, in their directly normal arrangement, are like those of the living *Ceratodus* (*Neoceratodus*) *forsteri*, Krefft. The inner border is more strongly convex than in the Jurassic species, *C. avus*, Smith Woodward,<sup>2</sup> but exhibits parallel, longitudinal grooves, as in that form. The grinding surface is nearly flat, or only slightly convex, and shallow sulci extend from between the bases of the denticles nearly along the entire surface to the inner margin. The grinding surface, moreover, is roughened by a regular series

1 New subgenus to include the Australian Mesozoic species. See note at end of paper.

2 Ann. Mag. Nat. Hist., ser. 7, vol. xviii., 1906, pp. 1-3, pl. i., figs. 1a, b. Reprinted in Rec. Geol. Surv. Victoria, vol. ii., pt. 2, 1907, pp. 135-137, pl. xiv.

of small pittings or areolations, the margins of which tend to form a rudely polygonal network. These pittings are much finer and closer than seem to be indicated in the woodcut given by Ameghino, of *Ceratodus iheringi*,<sup>1</sup> from the Upper Cretaceous of Patagonia. The splenial portion at the base projects from the tooth for about 4.5 mm., and is flange-like. At the junction of the tooth with the splenial, the lower surface is rather deeply excavated.

*Dimensions*.—Length of tooth when complete, about 35 mm. Length of second anterior denticle from its junction with the base, 6 mm. Length of anterior denticle, approximately 17 mm. when complete. Greatest height of tooth as distinct from the splenial bone, 10 mm.

*Occurrence*.—Upper Cretaceous (opal deposits). Walgett, C. Baradine, New South Wales. Collected and presented by T. C. Wollaston, Esq.

*Relationships*.—A British form, *Ceratodus disauris*, Agassiz,<sup>2</sup> from the Rhaetic of Aust. Cliff, shows, in the figure given by L. C. Miall,<sup>3</sup> four denticles, as in the present species. The denticles in the specimen mentioned, however, are more trenchant than in the present species.

*Ceratodus arus*, Smith Woodward,<sup>4</sup> shows a nearer relationship than other described forms, in having four denticles, and in these being comparatively short.

An Upper Cretaceous species from Patagonia, *C. iheringi*, Ameghino,<sup>5</sup> appears to be a palatal tooth. It has more salient denticles, five in number, and, according to Ameghino, shows closer alliance with the European mesozoic species than with the living Australian *C. (Neoceratodus) forsteri*.

Dr. Emile Haug has described a Cretaceous species of *Ceratodus* (*C. africanus*.) from Djoua, near Timassanine, in the Sahara,<sup>6</sup> which differs from the Triassic European examples in the presence of crenulations upon the anterior side of the tooth, and of six ridges instead of five, characters which approach those of the living lung-fish, *Ceratodus (Neoceratodus) forsteri*, of Queensland.

The surface character of the upper portion of the tooth of *C. wollostoni* bears a close resemblance to the recent *Ceratodus*, from

<sup>1</sup> Public. Univ. La Plata, No. 2, 1904, p. 10, fig. 1.

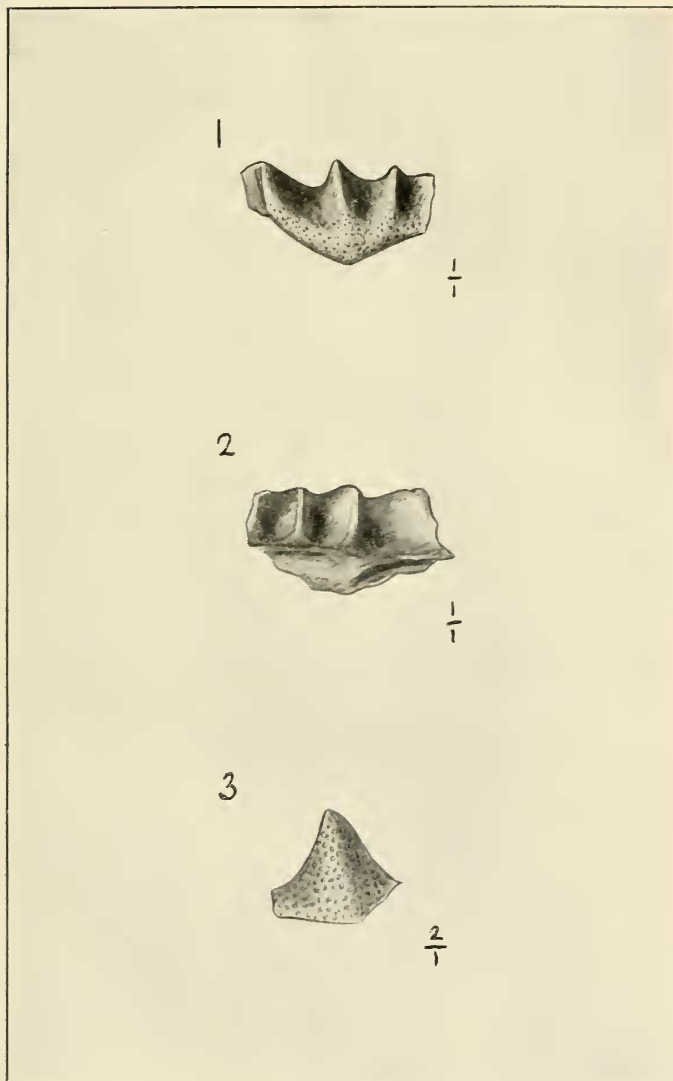
<sup>2</sup> Poissons fossiles, Atlas, vol. iii., 1838, pl. xix., fig. 19.

<sup>3</sup> See Miall (*Ceratodus parvus*, Miall non Agassiz, fide Woodward and Sherbon, Brit. Foss. Vert., 1896, p. 26), Pal. Soc. Mon., 1878, pl. v., fig. 7.

<sup>4</sup> Loc. supra cit., pl. i., figs. 1, 1a, b.

<sup>5</sup> Loc. supra cit., p. 10, fig. 1.

<sup>6</sup> C. R. Acad. Sci., Paris, vol. cxxxviii., 1904, p. 1526.



F.C. ad nat. del.

Tooth of *Ceratodus* (*Metaceratodus*) *wollastoni*, sp. nov.  
Upper Cretaceous; New South Wales.